

**REMARKS**

Applicants thank the Examiner for the third complete examination of the instant application. Claims 1-3, 6, 9-15, 17-22 and 36 are currently pending in the instant application. Dependent claims 17 and 20 have been amended hereby. Claims 1 and 23 are independent. Reconsideration of this application, as amended, is respectfully requested.

**REJECTIONS UNDER 35 U.S.C. § 112**

Claims 21 and 22 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. This rejection is respectfully traversed.

The Examiner asserts that dependent claims 21 and 22 are not in accordance with the specification. Specifically, the Examiner asserts that a buffer that includes rhenium and tantalum is not capable of one of altering and altering and blocking a substrate. Page 8, lines 7-16 of the instant specification states that an embodiment of present invention includes an Re-Ta alloy film 113. This Re-Ta alloy film 113 is applied over a substrate 112. As a result of the Re-Ta alloy film 113, the grains of the substrate 112 are largely pinned by the phases of the buffer film 113 at the boundaries and their growth is inhibited at the operating temperature (2100 °K). (Emphasis added.)

In accordance with the above description of an embodiment of the present invention, indeed the Re-Ta alloy film 113 alters and blocks the substrate 112. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the claim rejection under 35 U.S.C. § 112, second paragraph.

**REJECTION UNDER 35 U.S.C. § 102(E)**

Claims 1-3, 6, 9-12 and 36 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Saito et al., U.S. Patent No. 6,124,666. In addition, claims 1 and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Buxbaum, U.S. Patent No. 4,274,030. These rejections are respectfully traversed.

Independent claim 1 sets forth a combination of limitations including “said buffer inhibiting interaction of said emissive layer and said substrate by way of one of altering, and altering and blocking said substrate.” Applicants respectfully submit, for the following reasons, that the patent documents relied upon by the Examiner fail to teach or suggest at least this limitation of independent claim 1.

Saito et al. teach an electron tube cathode that includes a base 1, an alloy layer 4 and an electron emissive material layer 5. The alloy layer 4 is positioned between the base 1 and the electron emissive material layer 5.

The design of the electron tube cathode according to Saito et al. is distinctly different than that of the present invention, inasmuch as the alloy layer 4 performs as an interface between the base 1 and the electron emissive material layer 5. That is, Saito et al. teach that the base 1 is formed of mainly nickel, and includes at least one kind of reducing agent (Column 3, lines 13-14). Saito et al. further indicate that “in addition to the reducing agent in the base, the alloy layer contributes to the supply of excessive Ba, and the alloy layer serves to ensure the stable supply of the reducing agent at the interface.” (Column 4, lines 13-16.) Therefore, the alloy layer 4 cannot provide one of “blocking, and altering and blocking,” as the alloy layer 4 is designed to allow interaction between the base 1 and the electron emissive material layer 5.

In accordance with the above, Applicants respectfully submit that it is clear that Saito et al. fail to teach or suggest at least the above indicated limitation of independent claim 1. Moreover, Applicants respectfully submit that Saito et al. teach away from the invention as set forth in independent claim 1.

With regard to the rejected dependent claims, Applicants respectfully submit that these claims are allowable at least due to their dependence upon an allowable independent claim.

In accordance with the above, Applicants respectfully request reconsideration and withdrawal of the claim rejection under 35 U.S.C. § 102(e).

Turning now to the Buxbaum patent document relied upon by the Examiner, Fig. 1 of the patent document illustrates an activator substrate (generally shown by reference numeral 1, held in a frame 4). In addition to the substrate 1, the frame 4 also holds a barrier layer 3 and a surface layer 2. The surface layer 2 is made of platinum metal and the barrier layer 3 is made of a diffusion-inhibiting material such as rhenium. (See column 3, lines 30-38.)

Although the Buxbaum patent does teach a barrier layer 3, it is clear that the barrier layer 3 is incapable of inhibiting interaction of an emissive layer and a substrate “by way of one of altering and altering and blocking said substrate.” That is, Buxbaum clearly indicates that “the barrier layer must form no alloy with the diffusion-promoting additive which alters the activator substrate chemico-physically and could decrease its diffusion to the cathode surface.” (See column 2, lines 37-40; emphasis added.) This portion of the Buxbaum patent document clearly indicates that the barrier layer 3 does not alter or alter and block the substrate 1.

In accordance with the above, Applicants respectfully request reconsideration and withdrawal of claim rejection under 35 U.S.C. § 102(b).

**REJECTIONS UNDER 35 U.S.C. § 103(A)**

Claims 14 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Saito et al., U.S. Patent No. 6,124,666. This rejection is respectfully traversed.

Applicants respectfully submit that the rejected dependent claims are allowable at least due to their dependence upon an allowable independent claim. Accordingly, reconsideration and withdrawal of the claim rejection under 35 U.S.C. § 103(a) are respectfully requested.

**ALLOWABLE SUBJECT MATTER**

Applicants greatly appreciate the indication that claim 13 would be allowable if rewritten in independent form. However, at this time Applicants have not rewritten the claim in independent form as it is respectfully submitted that this claim is allowable at least due to dependence thereof upon an allowable independent claim.

**CONCLUSION**

All of the stated grounds of rejection have been properly traversed, accommodated, and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is condition for allowance.


If the Examiner believes, for any reason, that personal communication will expedite the prosecution of this application, the Examiner is invited to telephone Timothy R. Wyckoff (Reg. No. 46,175) at (703) 390-3030 in the Washington D.C. area.

Prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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**VERSION OF MARKED-UP CHANGES**

**IN THE CLAIMS**

The following claims have been amended:

17. (Amended) The thermoionic cathode of claim [16]1, wherein said buffer is an alloyed buffer.

20. (Amended) The thermoionic cathode of claim [16]1, wherein said buffer includes at least two of Re, Ta, C, Hf, Tc, Os, and Ru.